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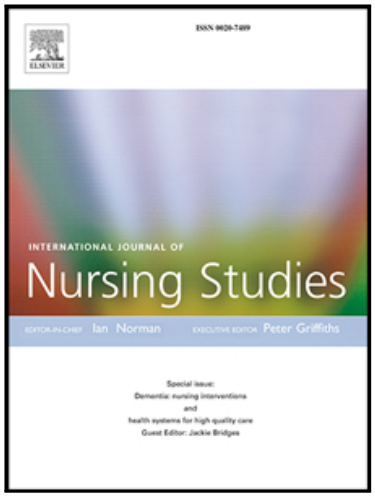


Witnessed resuscitation of adult and paediatric hospital patients: An umbrella review of the evidence

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# Title: Witnessed resuscitation of adult and paediatric hospital patients: An umbrella review of the evidence.

Short running title
*Witnessed cardio pulmonary resuscitation*

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**ABSTRACT**

**Objective:** To examine the research evidence about whether families were allowed to witness cardiopulmonary resuscitation on hospitalised adult and paediatric patients; and the views of patients, families and health professionals, about witnessed cardiopulmonary resuscitation.

**Design:** An umbrella review methodology of systematic reviews with sufficient methodological quality.

**Review methods:** Papers published in Spanish and English between, 1 January 2009 and 31 December 2018 were considered. The following databases were searched: PubMed, CINAHL, Web of Science, Scopus, Cochrane Central Register of Controlled Trials, PsycInfo, Embase, the Central Supplier Database and the Joanna Briggs Institute, Evidence-based Practice Database. Two independent reviewers assessed the papers for methodological quality employing instruments from the Joanna Briggs Institute. Critical appraisal**,** extraction and synthesis were carried out, employing the established methods for umbrella reviews and the protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO number CRD42019145610).

**Results:** The search identified 12 systematic reviews with moderate-to-high quality, which covered 110 original papers. Habitually, health professionals expressed controversial views and showed some reluctance to let families be present during cardiopulmonary resuscitation. In contrast, family members felt strongly that they should be present and patients agreed. Key factors that facilitated witnessed cardiopulmonary were a formal institutional policy, educating health professionals, and designating a health professional to support the family. Educational and cultural backgrounds influenced healthcare professionals' experiences and their attitudes

towards witnessed cardiopulmonary resuscitation. In general, Anglo-Saxon countries showed greater support for this practice. These included the United States, which was the country that dominated the literature on this subject.

**Conclusions:**

The best available evidence supports allowing the family to be present during cardiopulmonary resuscitation. It is necessary to include this practice in educational curricula and to train emergency personnel in its implementation. Culturally sensitive policies need to be designed, and the public to be aware of their right to be present.

**Keywords:** Cardiopulmonary resuscitation, evidence synthesis, family-centred care, life support, nurse, professional-family relationships, resuscitation, systematic reviews, witnessed.

**What is already known about the topic?**

- Witnessed cardiopulmonary resuscitation is not yet a widespread practice in all countries.
- This practice generates some controversy among health professionals.

**What this paper adds**

- The key barriers to witnessed cardiopulmonary resuscitation in hospitals include the lack of formal and culturally sensitive policies.
- Witnessed cardiopulmonary resuscitation needs to be included in educational curricula, and emergency personnel need specific training.

- Healthcare professionals need to understand and support witnessed cardiopulmonary resuscitation and the general public need to be aware of the practice.

## 1. Introduction

A wide range of international medical associations supports the presence of relatives during cardiopulmonary resuscitation (American Association of Critical-Care Nurses, 2007; Emergency Nurses Association, 1995; Fulbrook et al., 2007; Lippert, Raffay, Georgiou, Steen, & Bossaert, 2010; Oczkowski, Mazzetti, Cupido, & Fox-Robichaud, 2015a).

Most of the studies have been carried out in the United States, where this practice is more commonly accepted. Some studies have reported that families were more able to accept their grief; if they witnessed the efforts of the health team to save the lives of their loved ones (Oczkowski, Mazzetti, Cupido, & Fox-Robichaud, 2015b).

Many health professionals remain reluctant to give family members the opportunity to be present during medical procedures. However, the literature shows that nurses seem to be more open to relatives witnessing cardiopulmonary resuscitation than other disciplines (Duran, Oman, Jordan Abel, Koziel, & Szymanski, 2007; Mian, Warchal, Whitney, Fitzmaurice, & Tancredi, 2007).

Although different health systems worldwide have sought to abandon paternalistic attitudes and place the patient at the centre of care (Sak-Dankosky, Andruszkiewicz, Sherwood, & Kvist, 2014), some countries have achieved this better than others.

Allowing families to be present during cardiopulmonary resuscitation is still not common practice in some countries. A study of 31 countries carried out by

Mentzelopoulos et al (2016), primarily in the European Union, showed that 16 (52%) did not routinely allow family members, to be present during cardiopulmonary resuscitation. It is surprising how difficult it is to translate witnessed cardiopulmonary resuscitation into clinical practice. The debate has been going on since the late 1980s when Doyle et al (1987) questioned its possible benefits.

There are a number of vital determinants that are barriers or facilitators to the implementation of witnessed cardiopulmonary resuscitation (Giles, et al., 2016; McClement, et al., 2009). These include the socio-cultural context and the beliefs and values of the family and the health professionals.

The barriers described by health professionals have included a greater emotional impact on family members who lost a loved one after witnessing invasive and bloody scenes. They also expressed concerns that having family present could interrupt them from carrying out clinical manoeuvres. However, these studies also revealed barriers of a personal nature that hindered the development of witnessed cardiopulmonary resuscitation. For example, professionals stated that they were concerned about the ethical and legal consequences of their actions if family members witness distressing procedures that they did not understand (Giles et al., 2016; McClement et al., 2009).

In general, witnessing cardiopulmonary resuscitation seems to be more acceptable when it related to paediatric rather than adult patients (Vincent and Lederman, 2017). This different perception could be because the parents play a protective role when their child is ill and their increased accepted in most cultures. Parents have an inherent need to be there for their child, to provide comfort and support (Maxton, 2008).

Systematic reviews have been carried on primary studies that have synthesised the available evidence on witnessed cardiopulmonary resuscitation from a variety of perspectives. For example, Salmond et al (2014) approached the witnessed cardiopulmonary resuscitation of adult patients, from the perspective of health professionals; while authors, such as Dingeman et al (2007) focused on the parents of paediatric patients.

Because there have been so many systematic reviews on this topic, we felt it was necessary to undertake a systematic review of the existing reviews, to contrast and compare the published evidence (Aromataris et al., 2017). The aim of synthesising all aspects of the available evidence on witnessed cardiopulmonary resuscitation was, to make it easier for clinicians to make decisions about this practice, and facilitate the development of implementation strategies in different contexts. Previous studies have suggested that it is more difficult to achieve witnessed cardiopulmonary resuscitation in hospital settings than outside hospitals (Tíscar-González et al., 2019). As a result, this review focused on hospitals. It aimed to examine the research literature for evidence about the effects of witnessed cardiopulmonary resuscitation in adult and paediatric patients; from a variety of perspectives, namely patients, families and health professionals. The review also examined which factors influenced its development in hospitals.

The two questions for this review were: what were the effects of witnessed cardiopulmonary resuscitation for patients, their family and healthcare professionals in hospitals and what barriers and facilitators influenced its implementation?

## 2. Methods

An umbrella review methodology (Aromataris et al., 2017) was used to identify and evaluate published systematic review-level evidence on witnessed cardiopulmonary resuscitation of adult and paediatric hospital patients from multiple perspectives. These were patients who could undergo cardiopulmonary resuscitation, their family and health professionals.

### 2.1 Search strategy

A search strategy was developed and refined with contributions from an information specialist. PubMed, CINAHL, Web of Science, Scopus, the Cochrane Central Register of Controlled Trials, PsycInfo, Embase, the Central Supplier Database and the Joanna Briggs Institute evidence-based practice were thoroughly searched for relevant publications (Table 1). Papers published in Spanish and English, between 1 January 2009 and 31 December 2018, were considered for inclusion. A decision was made to start the review in 2009, as this the year before the European Resuscitation Council issued guidance that recommended the presence of family members during cardiopulmonary resuscitation (Lippert et al., 2010).

An initial search was carried out on PubMed. The keywords and phrases that were used in the studies, that were identified were then used to search the other databases. These included: resuscitation, family, family-centred care, family presence, evidence synthesis, systematic reviews and cardiopulmonary resuscitation.

This systematic review was designed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) publication standards for systematic reviews (Moher et al., 2015; Urrutia & Bonfill, 2010).

2.2. Inclusion and exclusion criteria

The inclusion criteria were determined using the Population, Intervention, Comparator and Outcome (PICO) model for clinical questions (Higgins & Green, 2008).

Studies were included if healthcare professionals, the patients and/or their relatives gave their views on the presence of relatives during adult or paediatric cardiopulmonary resuscitation.

The intervention and phenomena of interest were the presence of relatives during cardiopulmonary resuscitation in hospitals. The outcomes were the impact on the family, patients and health professionals, including the psychological outcomes and the quality of the resuscitation.

2.3. Data collection

The search identified 564 papers. After the duplicates were deleted, two researchers independently screened 319 papers for inclusion using their titles, abstracts and keywords. After the initial application of the inclusion and exclusion criteria, the full texts of 30 reviews were critically appraised. Any discrepancies between the two reviewers were resolved through discussions or by involving a third reviewer. The reviewers agreed to include 12 systematic reviews. Figure 1 provides the PRISMA flowchart that summarises the process (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009). The search results were imported into the Covidence management software.

The reviews that were included examined the perceptions and experiences of all those directly involved in cardiopulmonary resuscitation, namely patients, their family and health professionals. The review covered hospitalised adult and paediatric patients. 2.4. Quality appraisal

Two researchers, from the review team, individually critically appraised the 30 reviews; using the Joanna Briggs Institute critical appraisal tool for systematic reviews (Aromataris et al., 2015, 2017), which provides a checklist with 11 criteria (Appendix S1). Any discrepancies in the outcomes of the critical appraisals were resolved by discussion or by involving a third reviewer.

2.5. Data extraction and synthesis

Data-specific details on the population, study methods and results were included, based on the research question and specific objectives. A data extraction form was developed based on the PRISMA statement (Liberati et al., 2009) and agreed by the review team.

It was not possible to perform a meta-analysis of the quantitative research studies, due to the heterogeneity of the variables assessed in the reviews. These were: the mean duration and quality of the cardiopulmonary resuscitation, mortality rates, the families' psychological outcomes, the experiences and attitudes of the nurses and physicians, the perceived benefits and the barriers and facilitators to implementing and practising witnessed cardiopulmonary resuscitation.

The information from the reviews was analysed by two different independent reviewers, and the key information was summarised and identified the broad conclusions of each study. The results are presented using narrative synthesis, including appropriate tables and figures.

A detailed commentary on the major methodological problems or biases in the review has also been included, alongside an assessment of applicability. Additionally, the protocol of this umbrella review was registered in the International Prospective Register of Systematic Reviews (PROSPERO number CRD42019145610).

## 3. Results

Twelve systematic reviews that met the inclusion criteria were included and Figure 1 provides a flow diagram that outlines the selection process. Four reviews synthesised evidence from qualitative studies (Cypress & Frederickson, 2017; Ferreira, Blabino, Balieiro, & Mandetta, 2014; Rittenmeyer & Huffman, 2012; Smith McAlvin & Carew-lyons, 2014). Five were quantitative, including one meta-analysis (Oczkowski et al., 2015b; Paplanus et al, 2012a, 2012b; Powers et al, 2017; Porter et al, 2013). Three used mixed methods, as they were both qualitative and quantitative studies (Porter et al, 2014; Sak-Dankosky et al., 2014; Toronto and Larocco, 2019).

The reviews covered 110 original papers published between 1985 and 2017 and two-thirds (n=60) were from the United States. There were 10 papers from the United Kingdom, seven each from Australia and Turkey, five from Canada and four from Sweden. There were also two each from Belgium, France, Germany and China and one each from Iran, Israel, Malaysia, New Zealand, Norway, Ireland, South Africa and Singapore. One covered 31 different European countries.

Several reviews addressed witnessed adult cardiopulmonary resuscitation (Cypress and Frederickson, 2017; Oczkowski et al., 2015b; Paplanus et al., 2012a, 2012b; Porter et al., 2014; Porter et al., 2013; Powers, 2017; Rittenmeyer and Huffman,

2012; Sak-Dankosky et al., 2014; Toronto and Larocco, 2019). There were also reviews on witnessed paediatric cardiopulmonary resuscitation (Ferreira et al., 2014; Oczkowski et al., 2015b; Porter et al., 2014, 2013; Powers, 2017; Rittenmeyer and Huffman, 2012; Smith McAlvin and Carew-Lyons, 2014; Toronto and Larocco, 2019).

### 3.1. Aims and scope of the reviews

Some of the reviews describe the experiences of the patients on witnessed cardiopulmonary resuscitation (Cypress and Frederickson, 2017; Hassankhani et al., 2017; Paplanus et al., 2012b; Porter et al., 2013) and their family members (Cypress and Frederickson, 2017; Oczkowski et al., 2015b; Paplanus et al., 2012a; Porter et al., 2013; Rittenmeyer and Huffman, 2012; Smith McAlvin and Carew-Lyons, 2014; Toronto and Larocco, 2019). Others focused on nurses (Cypress and Frederickson, 2017; Paplanus et al., 2012b; Porter et al., 2013; Rittenmeyer and Huffman, 2012; Sak-Dankosky et al., 2014) and physicians (Paplanus et al., 2012b; Porter et al., 2013; Rittenmeyer and Huffman, 2012; Sak-Dankosky et al., 2014).

Powers' review (2017) assessed the effect of education on the support that healthcare staff provided for families during resuscitation. Oczkowski's review (2015b) evaluated the effect of offering the family the chance to be present during resuscitation compared to standard patient care, which did not provide that opportunity. The comparison related to whether the patients died, the quality of the cardiopulmonary resuscitation and the psychological effect on the family members.

The two remaining reviews aimed to develop an understanding of the perceived benefits, barriers, enablers and actions to implementing and practising having families present during resuscitation (Ferreira et al., 2014; Porter et al., 2014).

3.2. Quality of the included reviews

Table 2 summarises the critical appraisal results, based on the Joanna Briggs Institute critical appraisal tool for systematic reviews (Aromataris et al., 2015). Only moderate-to-high quality reviews were included. Low-quality reviews were excluded.

3.3. Main findings and conclusions of the reviews

Table 3 summarises the main findings of the reviews that were included. Table 4 provides a more detailed summary; which includes factors such as the number of studies each review covered, the participants and sampling, the medical service and the countries studied. The narrative synthesis aimed to respond to the two main objectives set out in this umbrella review.

3.3.1 Effects of witnessed cardiopulmonary resuscitation.

Family members felt strongly that they should be present while their loved one received cardiopulmonary resuscitation (Cypress and Frederickson, 2017; Paplanus et al., 2012a; Rittenmeyer and Huffman, 2012; Smith McAlvin and Carew-Lyons, 2014; Toronto and Larocco, 2019) and that it was their fundamental right (Paplanus et al., 2012a; Rittenmeyer and Huffman, 2012; Toronto and Larocco, 2019).

Family members who participated in Meyers' qualitative study (1998), cited by Toronto and Larocco (2019); said that patients were not hospital property and that families, needed to be given the choice and opportunity to be there.

Families felt that being present during cardiopulmonary resuscitation could benefit the patient because they could have information that could be useful to the healthcare team. Some studies said that families felt their presence could comfort the patient, even when they were unconscious. They were able to touch the patient

and if they died, they had the chance to be there for their last moments of life (Cypress and Frederickson, 2017; Ferreira et al., 2014; Leske, McAndrew, and Brasel, 2013; Paplanus et al., 2012b; Toronto and Larocco, 2019). That feeling increased in if the patient was a child because the parents felt that they were their children's protectors (Smith McAlvin and Carew-Lyons, 2014).

The literature agreed that witnessed cardiopulmonary resuscitation helped families to accept the death of their loved one; because they could see, that every possible effort had been made to save their life (Cypress and Frederickson, 2017; Ferreira et al., 2014; Leske et al., 2013; Porter et al., 2014; Rittenmeyer and Huffman, 2012; Toronto and Larocco, 2019).

On the contrary, not having the opportunity to be present could contribute to the family's emotional trauma. The family members who participated in Ferreira's study (2014) recognised that, although it was hard to be present, it might have been worse for them to be absent (Ferreira et al., 2014).

Of the 12 systematic reviews included in this study, only three considered the matter from the perspective of patients (Cypress and Frederickson, 2017; Paplanus et al., 2012a; Porter et al., 2013). In general, patients supported witnessed cardiopulmonary resuscitation and consider it to be a right (Cypress and Frederickson, 2017; Paplanus et al., 2012a). They felt hospitals should ask them about their preferences about this when they were admitted (Paplanus et al., 2012a). Where there was a good acceptance of this practice, some studies revealed patients' concerns about breaches of confidentiality (Albarran, Moule, Benger, Mcmahon-parkes, and Lockyer, 2009; Paplanus et al., 2012a).

In general, the views of health professionals were controversial, as there was some reluctance to develop the practice of witnessed cardiopulmonary resuscitation

(Rittenmeyer and Huffman, 2012; Sak-Dankosky et al., 2014). For example, an integrative review by Sak-Dankosky (2014) found; that only two of the 15 studies reported that professionals defended the family's right to be present during resuscitation without hesitation.

An issue of concern to both health professionals and family members was whether witnessed cardiopulmonary resuscitation might complicate resuscitation manoeuvres. Health professionals believed that families could interfere with manoeuvres and that staff stress could be increased because of the fear of litigation (Paplanus et al., 2012b; Porter et al., 2014, 2013; Rittenmeyer and Huffman, 2012). Two studies reported families were concerned about whether their presence might be detrimental to efforts to save their loved one (Paplanus et al., 2012b; Rittenmeyer and Huffman, 2012). However, a meta-analysis by Oczkowski (2015b) found there was no difference in mortality rates; the resuscitation quality and the psychological health of family members when families were or were not present during resuscitation (Oczkowski et al., 2015b).

Professionals also felt that seeing distressing scenes could psychologically affect the family. However, family members who had already witnessed cardiopulmonary resuscitation said they would choose to be present again and would recommend it to others (Smith McAlvin and Carew-Lyons, 2014).



### 3.3.2 Facilitators and barriers to the implementation of witnessed cardiopulmonary resuscitation.

Several studies examined facilitators. The essential aspects for families were emotional support, feelings of safety and comfort, understanding what was happening and being kept informed (Cypress and Frederickson, 2017). Most of the

policies that were studied reinforced the need for a healthcare professional to support the family during witnessed cardiopulmonary resuscitation (Ferreira et al., 2014; Paplanus et al., 2012b; Porter et al., 2014, 2013; Rittenmeyer and Huffman, 2012). This professional needed not to actively participate in the resuscitation manoeuvres (Porter et al., 2014, 2013). McAlvin (2014) recommended that the most experienced healthcare professional should act as a liaison between the team and the family.

The systematic review conducted by Powers (2017) analysed studies that looked at what happened when resuscitation education sessions included the presence of people playing the roles of family members. Thirteen of the 16 studies that were included in that review reported that their presence during resuscitation education had a positive effect on health professionals' attitudes. Educational interventions can improve healthcare professionals' perceptions of witnessed cardiopulmonary resuscitation and increase their comfort and self-confidence in the implementation of such policies. After the educational interventions, health professionals also increased their willingness to offer families the chance to be present during resuscitation (Porter et al., 2014; Powers, 2017).

Finally, the duration of clinical practice, the study setting and the presence of a formal institutional policy; have been described as key factors that influenced the perspectives of healthcare providers concerning witnessed cardiopulmonary resuscitation (Paplanus et al., 2012b). One of the most important barriers, which was described by most reviews, was the lack of formal policies or written guidelines about when families could be present in hospitals (Cypress and Frederickson, 2017). Developing institutional policies is very important (Ferreira et al., 2014; Rittenmeyer and Huffman, 2012; Smith McAlvin and Carew-Lyons, 2014) and so is designing

structures that provide support for healthcare practitioners to enable them to openly support witnessed cardiopulmonary resuscitation (Rittenmeyer and Huffman, 2012). Paplanus (2012b) suggested that the general reason why professionals were reluctant to implement witnessed cardiopulmonary resuscitation was not because of the results. The authors said it was because the processes needed to be defined and decisions had to be made for these policies to be implemented.

Some studies have suggested that sociocultural backgrounds may have a bearing on how healthcare professionals make decisions about witnessed cardiopulmonary resuscitation (J. Porter et al., 2012; Rittenmeyer and Huffman, 2012; Sak-Dankosky et al., 2014). Studies conducted in countries such as Turkey, Israel, Germany, Malaysia, Iran and China identified strong opposition to witnessed cardiopulmonary resuscitation (Sak-Dankosky et al., 2014). Several studies reported that having families present during resuscitation was an unknown concept in Asia and that this could explain the resistance of physicians towards this practice on the Asian continent (Sheng, Lim, and Rashidi, 2010).

A meta-analysis by Paplanus et al (2012b), suggested that there was a potential regional component in opposition to decision making about witnessed cardiopulmonary resuscitation in studies carried out in different regions of Turkey. Several factors could explain this difference, such as local cultural differences in the beliefs and attitudes of healthcare professionals towards families being present during resuscitation. Other aspects that have been described as facilitators for this practice include professionals having previous experience of witnessed cardiopulmonary resuscitation, the existence of formal policies on these issues and Western settings.

In the same systematic review (Paplanus et al., 2012b), studies from certain countries showed a preference for families being present during resuscitation, namely: the United Kingdom (Grice et al., 2003), Ireland (Madden and Condon, 2007), Australia (Dwyer, 2009) and the United States (Doyle et al., 1987; Engel et al., 2007; Macy et al., 2006; Meyers et al., 1998). However, studies from Belgium (Mortelmans et al.,

2009), Germany (Kirchhoff et al., 2007; Köberich et al., 2010), Singapore (Ong et al., 2007) Turkey (Günes and Zaybak, 2009; Mian et al., 2007; Yanturali et al., 2005) and the European survey (Axelsson et al., 2010; Fulbrook et al., 2005) did not support families being present. Turkey had the lowest support scores. These results suggest that Anglo-Saxon countries are more in favour of this practice from a sociocultural point of view.

Most professionals were generally in favour of families being present during resuscitation. However, Rittenmeyer (2012) and Porter (2014) concluded that nurses seemed to more comfortable than other health professionals and they supported policies that facilitated the implementation of witnessed cardiopulmonary resuscitation.

Healthcare professionals' attitudes were a key factor in the implementation and development of witnessed cardiopulmonary resuscitation. The fear that cardiopulmonary resuscitation could be a traumatic experience for the family was another barrier described by health professionals (Porter et al., 2014). However, studies showed that most family members were not concerned about the psychological effects (Toronto and Larocco, 2019). Indeed, people who had previously witnessed cardiopulmonary resuscitation were more supportive.

## 4. Discussion

Although international guidelines and evidence recommend that family are present during resuscitation, witnessed cardiopulmonary resuscitation has rarely been implemented in most of the countries that we studied (Sak-Dankosky et al., 2014).

The scientific literature shows how witnessed cardiopulmonary resuscitation is a safe and beneficial practice for families, patients and health professionals (Cypress and Frederickson, 2017; Ferreira et al., 2014; Oczkowski et al., 2015b; Paplanus et al., 2012a, 2012b, Porter et al., 2014, 2013; Powers, 2017; Rittenmeyer and Huffman, 2012; Sak-Dankosky et al., 2014; Smith McAlvin and Carew-Lyons, 2014; Toronto and Larocco, 2019).

There has been moderate-quality evidence in adult studies and low-quality evidence in paediatric studies that family being present during resuscitation did not affect resuscitation outcomes, such as mortality or resuscitation quality (Ferreira et al., 2014; Oczkowski et al., 2015b). The existing moderate-quality evidence for adult cardiopulmonary resuscitation suggests that allowing families to be present during resuscitation also improved psychological outcomes in family members, such as anxiety and depression (Oczkowski et al., 2015b).

Most of the papers assessed by the 12 systematic reviews had been developed in the United States, where the majority of health professionals support witnessed cardiopulmonary resuscitation, with no variations between the different disciplines (Howlett and Gail, 2010).

In general, there was wide acceptance in the United States of the presence of families in both paediatric and neonatal intensive care units.

Health professionals said that family members needed to be asked in advance if they wanted to be present if their loved one needed to be resuscitated (Paplanus et al.,

2012b; Porter et al., 2014; Sak-Dankosky et al., 2014). The suitability of the unit, the staff and the family members should be evaluated on a case-by-case basis. Assessing the psychological state of the family may also be helpful (Ferreira et al., 2014). One study pointed out that it is vital to continually assess the wishes of the patient's family and they should be removed from the cardiopulmonary resuscitation area if they become disruptive or obstructive (Smith McAlvin and Carew-Lyons, 2014).

Because healthcare professionals are crucial to successfully implementing witnessed cardiopulmonary resuscitation, staff education is necessary and course providers should integrate the presence of family members into any training, particularly for emergency personnel (Porter et al., 2014, 2013).

Professionals must empower families to decide whether or not they want to be present (Rittenmeyer and Huffman, 2012), and nursing staff must take the lead in implementing this practice (Paplanus et al., 2012b).

This study provides an umbrella review of the existing reviews that examined witnessed cardiopulmonary resuscitation in hospitals. The need for 'fast' evidence in a reduced timeframe is key to supporting evidence-informed policy decisions (Aromataris et al., 2017).

This umbrella review had some limitations that should be noted. Most of the studies that were included were developed in intensive care units and emergency departments. Because cardiopulmonary arrests can happen anywhere, further quality research in other hospital settings is needed, including longer follow-up studies of family members who witnessed cardiopulmonary resuscitation (Oczkowski et al., 2015b). Besides, only three of the 12 systematic reviews took into account the

opinions of patients (Cypress and Frederickson, 2017; Paplanus et al., 2012a; Porter et al., 2013).

Most studies were carried out in the United States, where it is a widespread practice to have family members present during cardiopulmonary resuscitation and the practice is well accepted by most healthcare professionals and the general population. To understand this situation, it is necessary to delve more deeply into the existing sociocultural differences between Latin and Anglo-Saxon countries.

As Walter (2012) explained in his paper entitled *Why different countries manage death differently: a comparative analysis of modern urban societies,* culture plays a key role in how families recognise the roles of professionals and how professionals see themselves. Other key factors that drive society's perceptions are whether the professionals are state employees or work for the private sector or a charitable organization and whether or not health insurance is universal. All of these different cultural situations influence how patients and families perceive health professionals and even how they exercise their rights to autonomy. For example, in Italy, someone who is dying traditionally leaves care decisions in the hands of their family, while the autonomy of the dying person is promoted in the United States and the United Kingdom (Walter, 2012).

We were unable to find any systematic reviews that covered Asian or Latin countries. Although there were two systemic reviews that were developed by Brazilian researchers, including one published in 2019 (Barreto et al., 2019; Ferreira et al., 2014), the primary studies they included had been developed in other countries. More original studies and reviews are needed covering countries where witnessed cardiopulmonary resuscitation is not common. Only one of the 12 systematic reviews included in this study reviewed papers published in a language other than English,

namely Portuguese or Spanish (Ferreira et al., 2014). This could be another limitation.

## 5. Implications for research and policy

This was the first umbrella review to explore the perspectives of health professionals, patients and families on witnessed cardiopulmonary resuscitation in both hospitalised paediatric and adult patients. Sociocultural aspects had a direct influence on witnessed cardiopulmonary resuscitation and they should be considered by further research; that considers the effects of this practice on families and healthcare professionals. The results of several studies revealed Anglo-Saxon cultures, like those in the United States and the United Kingdom, generally facilitated the presence of families during cardiopulmonary resuscitation.

Training initiatives are necessary to encourage professionals to look at their reservations and adopt more positive attitudes to witnessed cardiopulmonary resuscitation (Ferreira et al., 2014). We hope the results of this study will inform the design of culturally sensitive policies; that respect the rights and wishes of patients and their families and enable families to be present during cardiopulmonary resuscitation, with the support and agreement of health professionals.

Further research is required to assess the extent to which witnessed cardiopulmonary resuscitation is implemented and practised (Porter et al., 2013) and existing staff training also needs to be evaluated. Nurses must take a lead role in implementing this practice (Paplanus et al., 2012a).

## 6. Conclusions

All of the available evidence in this review supports allowing families to be present during cardiopulmonary resuscitation. However, educational and cultural backgrounds influence of healthcare professionals' experiences and attitudes towards, this practice.

It is necessary to integrate the presence of family members into educational curricula and provide emergency personnel with relevant training. Furthermore, the general population need to be aware of the practice so that they can ask to be present.

Culturally sensitive policies also need to be designed, that respect the rights and wishes of patients and their families, and to make sure healthcare professionals make it possible for families to witness cardiopulmonary resuscitation if they want to.

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**Conflict of interest**
The authors declare that there is no conflict of interest.

**Author contributions**
Verónica TÍSCAR-GONZÁLEZ participated in the design of the study being the main responsible for its development as well as the data abstraction and writing of the manuscript.
Montserrat GEA-SÁNCHEZ, Joan BLANCO-BLANCO participated in the design of the study and in the final drafting of the manuscript.
Maria Teresa MORENO-CASBAS led the design of the study, participated in the design of the study and in the final drafting of the manuscript.
Roland PASTELLS-PEIRÓ and Nuria DE RÍOS-BRIZ participated in the design of the study and in the final drafting of the manuscript.
All authors declare that there has been no conflict of interest as well as have participated, reviewed and accepted the content of the manuscript.

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**PRISMA 2009 Flow Diagram**

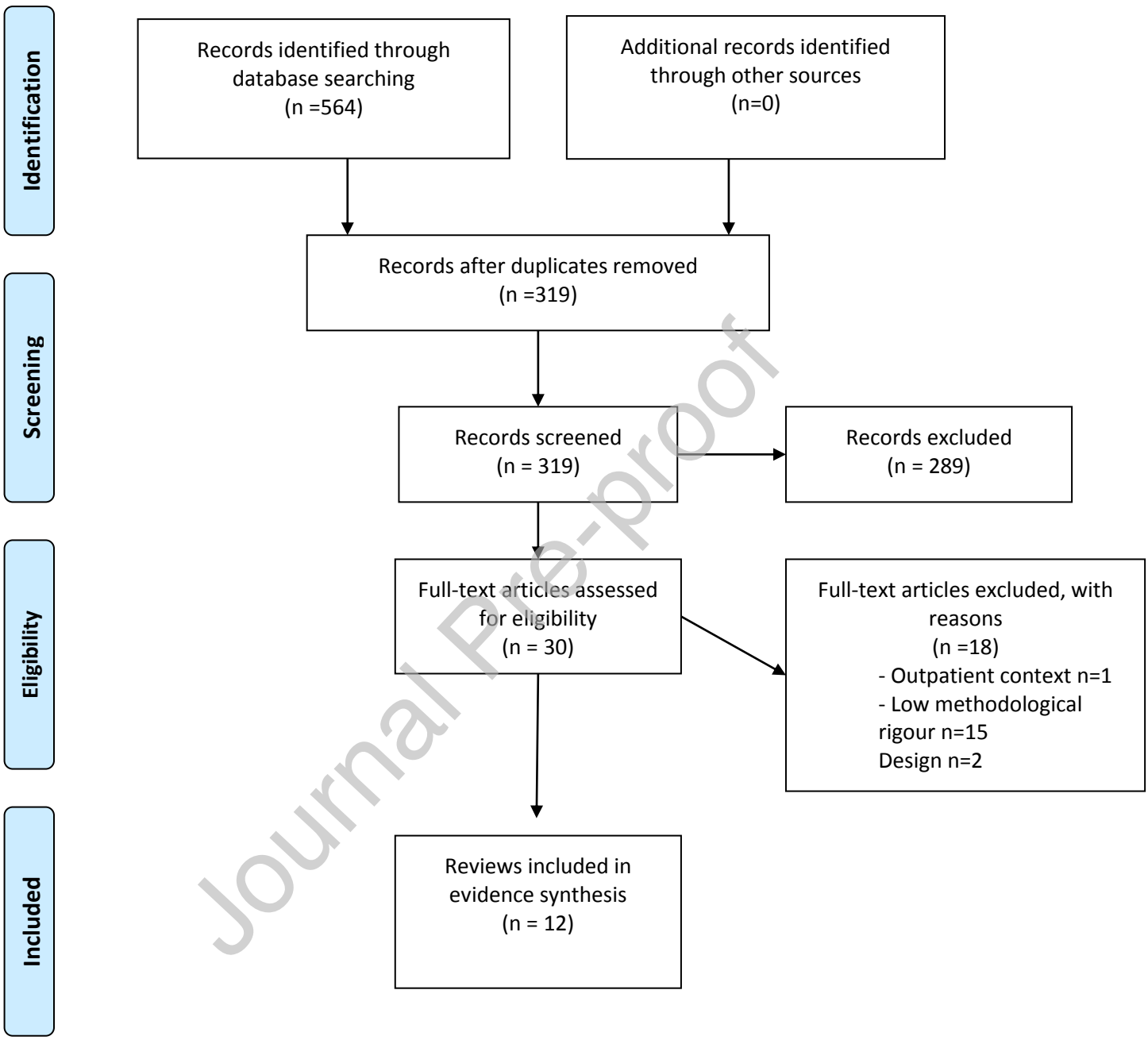

**Table 1: Database search strategy**

Database: **PubMed**

Filters: **Language; Dates of publication**

Total: **96**

("Cardiopulmonary Resuscitation"[Mesh] OR Resuscitation[tiab] OR "Life Support"[tiab] OR CPR[tiab]) AND ("Family"[Mesh:NoExp] OR ((Family[tiab] OR Families[tiab] OR Familiar*[tiab] OR Relatives[tiab]) AND (Witness*[tiab] OR Presenc*[tiab])) OR "Professional-Family Relations"[Mesh] OR "Professional Family"[tiab] OR "Professional-Family"[tiab] OR "Family Professional"[tiab] OR "Family-Professional"[tiab]) AND (systematic[sb] OR "meta-analysis"[pt] OR "meta-analysis as topic"[Mesh] OR "meta analy*"[tw] OR metanaly*[tw] OR metaanaly*[tw] OR "met analy*"[tw] OR "integrative research"[tiab] OR Review[tiab] OR "integrative review*"[tiab] OR "integrative overview*"[tiab] OR "research integration*"[tiab] OR "research overview*"[tiab] OR "collaborative review*"[tiab] OR "collaborative overview*"[tiab] OR "systematic review*"[tiab] OR "Review Literature as Topic"[Mesh] OR Review[ptyp] OR "technology assessment*"[tiab] OR "technology overview*"[tiab] OR "Technology Assessment, Biomedical"[Mesh] OR HTA[tiab] OR HTAs[tiab] OR "comparative efficacy"[tiab] OR "comparative effectiveness"[tiab] OR "outcomes research"[tiab] OR "indirect comparison*"[tiab] OR (("indirect treatment"[tiab] OR "mixed-treatment"[tiab]) AND (comparison*[tiab])) OR Embase*[tiab] OR Cinahl*[tiab] OR "systematic overview*"[tiab] OR "methodological overview*"[tiab] OR "methodologic overview*"[tiab] OR "methodological review*"[tiab] OR "methodologic review*"[tiab] OR "quantitative review*"[tiab] OR "quantitative overview*"[tiab] OR "quantitative synthes*"[tiab] OR "pooled analy*"[tiab] OR Cochrane[tiab] OR Medline[tiab] OR Pubmed[tiab] OR Medlars[tiab] OR handsearch*[tiab] OR "hand search*"[tiab] OR "meta-regression*"[tiab] OR metaregression*[tiab] OR "data synthes*"[tiab] OR "data extraction"[tiab] OR "data abstraction*"[tiab] OR "mantel haenszel"[tiab] OR peto[tiab] OR "der-simonian"[tiab] OR dersimonian[tiab] OR "fixed effect*"[tiab] OR Review[tiab])

**Table 2. Results for the critical appraisal**
Each criteria is scored Yes (Y), No (N), Unclear (U) or Not applicable (NA)

| Citation | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cypress et al (2017)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |
| **Powers et al (2017)** | Y | Y | Y | Y | Y | U | U | Y | U | Y | Y |
| **Sak-Dankosky et al (2013)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |
| **Oczkowski et al (2015)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |
| **McAlvin et al (2014)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |
| **Paplanus et al (2012) PART I** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **Paplanus et al (2012) PART II** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **Porter et al (2012)** | Y | Y | Y | Y | Y | Y | U | Y | U | Y | U |
| **Porter et al (2014)** | Y | Y | Y | Y | Y | Y | U | Y | NA | Y | Y |
| **Rittenmeyer et al (2012)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |
| **Ferreira et al (2014)** | Y | Y | Y | Y | Y | U | Y | Y | NA | Y | U |
| **Toronto et al (2018)** | Y | Y | Y | Y | Y | Y | Y | Y | NA | Y | Y |

**Q1:** Was the review question clearly and explicitly stated?
**Q2:** Were the inclusion criteria appropriate for the review question?
**Q3:** Was the search strategy appropriate?
**Q4:** Were the sources and resources used to search for studies adequate?
**Q5:** Were the criteria for appraising studies appropriate?

**Q6:** Was the critical appraisal independently conducted by two or more reviewers?

**Q7:** Were there methods to minimize errors in data extraction?

**Q8:** Were the methods used to combine studies appropriate?

**Q9:** Was the likelihood of publication bias assessed?

**Q10:** Were recommendations for policy and/or practice supported by the reported data?

**Q11:** Were the specific directives for new research appropriate?

**Table 3: Results presented by the systematic reviews that were included**

| Review, year | Summary of findings/conclusions | Comments |
|---|---|---|
| Paplanus et al. (2012) Part I | Families and patients showed strong support for witnessed cardiopulmonary resuscitation, and they believed that it was a right.<br>Some studies revealed patients' concerns about breach of confidentiality.<br>People who had previously witnessed cardiopulmonary resuscitation showed more supportive attitudes.<br>Nursing needed to take the lead role in implementing this practice. | There was no evidence about witnessed cardiopulmonary resuscitation of adult patients. |
| Paplanus et al. (2012) Part II | The duration of clinical practice, the study setting and the presence of a formal institutional policy were key factors; that influenced the perspectives of healthcare providers on witnessed cardiopulmonary resuscitation.<br>The reason why professionals are reluctant to endorse witnessed cardiopulmonary resuscitation was not because of its results; but because of the lack of definition of the processes and decision-making required for its implementation.<br>There was a potential regional component in the opposition to decision making in the studies from diverse regions of Turkey. Several factors could explain this: local cultural differences in the beliefs and attitudes of healthcare professionals towards witnessed cardiopulmonary resuscitation, prior professional experience with this practice, the existence of formal policies and working in a Western setting.<br>The studies conducted in Belgium, Germany, Singapore, Turkey, and the European surveys, did not support the use of witnessed cardiopulmonary resuscitation. Turkey showed the lowest support scores. The studies from the United Kingdom, Ireland, Australia and the United States were in favour of witnessed cardiopulmonary resuscitation.<br>Healthcare professionals believed the family could interfere with manoeuvres and increase staff stress. | There was no strong evidence from the actual witnessed cardiopulmonary resuscitation experiences of healthcare professionals.<br>More randomised controlled designs studies are needed, for example, to evaluate educational programs that use simulations or train health professionals with diverse demographics. These could include experiences and supporting formal witnessed cardiopulmonary resuscitation policies. |
| Sak-Dankosky et al. (2013) | Cultural and educational backgrounds influenced healthcare professionals' experiences and attitudes to witnessed cardiopulmonary resuscitation.<br>Although international guidelines recommended that family could be present during cardiopulmonary resuscitation, the practice was very widely unimplemented.<br>There was a lack of local guidelines and policies.<br>Training would increase healthcare professionals' | |

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|---|---|---|
| | awareness of the benefits and limitations of witnessed cardiopulmonary resuscitation.<br>Only two studies out of 15 reported that most healthcare professionals claimed that they supported this practice. | |
| **Review & Year** | **Summary of findings/conclusions** | **Comments** |
| Porter et al. (2013) | Witnessed cardiopulmonary resuscitation needs to be integrated into curricula and emergency personnel need training. The general population also needed being aware of it.<br>It was important to create a supporting staff role.<br>The available evidence supports witnessed cardiopulmonary resuscitation in the emergency department. Staff, family members and the general public endorsed the practice. | Further research is required to assess the extent to which witnessed cardiopulmonary resuscitation is implemented and practiced.<br>Staff training must also be evaluated. |
| Porter et al. (2014) | Health professionals agreed that witnessed cardiopulmonary resuscitation helped with the grieving process.<br>However, its barriers included fear of litigation, increased stress and anxiety levels, traumatic experiences, fears that family would interfere with the resuscitation and fears that staff would be distracted by distressed relatives.<br>The supporting healthcare professional was important, and this person should not actively participate in cardiopulmonary resuscitation.<br>It was necessary to educate staff to successfully implement this practice. Emergency staff education could significantly affect attitudes in favour of families being present.<br>Offering the choice of being present was essential. | |
| McAlvin et al. (2014) | Parents wanted to be present when their child was undergoing invasive procedures or cardiopulmonary resuscitation.<br>They felt their presence would comfort their child during cardiopulmonary resuscitation.<br>Liaison between the healthcare team and the family should be encouraged.<br>It was important continuously assess the patient's family. Parents needed to be moved from the cardiopulmonary resuscitation area if their behaviour became disruptive or obstructive.<br>Health professionals were more likely to develop witnessed cardiopulmonary resuscitation if there was a written policy. | There was a lack of evidence about how a family's presence during cardiopulmonary resuscitation or invasive procedures influenced a parent's ability to cope with the procedure and their satisfaction with the care. Multicentre studies with larger sample sizes are needed. |
| Oczkowski | Offering witnessed cardiopulmonary resuscitation | The meta-analysis was |

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|---|---|---|
| et al. (2015) | did not affect resuscitation outcomes, like mortality or cardiopulmonary resuscitation quality. There was moderate-quality evidence of this for adult patients and low-quality evidence for children.<br>The moderate-quality evidence in adults suggested that witnessed cardiopulmonary resuscitation may also improve psychological outcomes in family members. | limited by the limited number of quality trials, as well as the samples and quality.<br>Further quality research is needed in other hospital settings.<br>There was limited evidence of the effects of offering witnessed cardiopulmonary resuscitation. |
| **Review & Year** | **Summary of findings/conclusions** | **Comments** |
| Cypress et al. (2017) | Allowing family to be present during cardiopulmonary resuscitation (cardiopulmonary resuscitation) had a positive impact on patients, their family members and nurses. Family members had the right to be present during cardiopulmonary resuscitation.<br>Close physical proximity was key for families. They needed comforting their loved one and could even provide spiritual support.<br>Family had the right to know, understand and be informed of what was happening. Communicating with medical staff about a patient's condition was really important for families.<br>Professionals attempted to make families feel emotionally supported, safe and comfortable to guarantee respect for their integrity.<br>Engaging with families helped them to find meaning, consolation and endurance to rebuild their lives.<br>The lack of formal policies and written guidelines about witnessed cardiopulmonary resuscitation throughout in hospitals was an issue. | |
| Powers, K. A. (2017) | 13 of the 16 studies demonstrated that having people playing the role of family members during resuscitation education had a beneficial effect. Educational interventions could improve the perception of having family present during resuscitation and increase healthcare professionals' level of comfort and self-confidence during its implementation. After the educational intervention, health professionals increased their willingness to offer the family the option of being present during resuscitation.<br>No recommendations stated the most effective approach to witnessed cardiopulmonary | |

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| | resuscitation education and more original research on this is needed. | |
| Toronto et al. (2018) | Families considered that witnessed cardiopulmonary resuscitation was a fundamental right.<br>They described the benefits to the patient and themselves.<br>It was necessary to establish policies that guaranteed an adequate level of training for health professionals and provide the resources needed to facilitate witnessed cardiopulmonary resuscitation.<br>Most family members were not concerned with the potential for adverse psychological effects after witnessing cardiopulmonary resuscitation.<br>The families felt that being present during cardiopulmonary resuscitation benefitted the patient, because they could have information that could be useful to medical staff. Families considered that with their presence could make the patient feel more comfortable, even if they were unconscious.<br>They could touch the patient and if the patient died they would be able to participate in post-mortem care.<br>Being present during cardiopulmonary resuscitation allowed families to feel confident that every effort had been made to save the patient's life. | More experimental design studies are needed.<br><br>The only study included was conducted in an Eastern country. |
| **Review & Year** | **Summary of findings/conclusions** | **Comments** |
| Rittenmeyer et al. (2012) | Most family members believed they had the right to be present. Healthcare practitioners needed to have control over witnessed cardiopulmonary resuscitation.<br>Healthcare providers need to be actively involved in creating policies and procedures for witnessed cardiopulmonary resuscitation.<br>Nurses seem to be most comfortable with the family being present during cardiopulmonary resuscitation and they advocated for policies that enabled its implementation. Indeed, most professionals were in favour of this practice.<br><br>The results of 25 qualitative systematic reviews were synthesised into five findings:<br>1. Conditional acceptance. Most healthcare staff and family members accepted families being present during resuscitation and invasive procedures and acknowledged its multiple benefits. | In some studies, the patient's voice was not completely represented.<br><br>In this review, only papers in English were included. A study in Portuguese needed to be excluded. |

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| | 2. Hovering uneasiness. Although they were in favour of the practice, professionals show reticence, including anxiety about interruptions.<br>3. Confronting reality. The family could make better decisions on behalf of their relatives if they knew the context of the situation.<br>4. Family empowerment. Professionals needed to empower families to decide whether or not they want to be present during cardiopulmonary resuscitation.<br>5. Unwavering rejection. Some healthcare providers were wholly opposed to allowing families to be present during resuscitation or invasive procedures and it was necessary to modify their restrictive beliefs about this. | |
| Ferreira et al. (2014) | Not having the opportunity to be present could contribute to the emotional trauma of parents. Although they found it difficult to be present, they felt that leaving would be worse.<br>If the child died, the family could share the ultimate moments of their life.<br>Developing a declared institutional policy was key.<br>Witnessed cardiopulmonary resuscitation did not affect the efficiency of the team during the rescue attempt.<br>It was necessary to document the reasons if witnessed cardiopulmonary resuscitation was not offered.<br>It was important to evaluate the suitability of the unit, the staff and the family on a case-by-case basis. | |

**Table 4: Summary of the scope of the 12 reviews covered by the umbrella review**

| Authors | Aim | Methodology/ Search strategy | Review typology | Number of studies included | Participants and sampling | Service studied | Number of studies from each country |
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| Rittenmeyer et al. (2012) | To synthesise the best available research evidence of the experiences of families and healthcare practitioners' experiences about witnessed cardiopulmonary resuscitation and invasive procedures. | BioMed Central, CINAHL, Nursing/Academic Edition, Science Direct, EMBASE, ISI, Web of Knowledge, MEDLINE, PsycINFO, Psychlit, SCOPUS TRIP, Sociological Abstracts, MEDNAR, Digital Dissertations, Proquest Dissertations, Theses FADE, Library Index to Theses, Networked, Digital Library of Theses, Dissertations, NurseScribe, | A systematic review. Meta-aggregation or synthesis of findings. | 25 studies in total<br>4 phenomenology<br>6 mixed methods<br>15 qualitative descriptive studies. | Family members and health care practitioners who had experienced the phenomena of family presence during resuscitation or invasive procedures. | Adult and paediatric intensive care-units and emergency departments. | 16 United States<br>1 South Africa<br>1 Germany<br>2 Canada<br>2 Australia<br>1 England<br>2 Sweden |

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| | | DiVA, Institute for Health & Social Care, Research PsycExtra, Public Health Agency of Canada. From 1985 to 2009 in English. | | | | | |
| **Authors** | **Aim** | **Methodology** | **Review typology** | **Number of studies included** | **Participants and sampling** | **Service** | **Countries** |
| Paplanus et al. (2012) PART I | To examine the effect of witnessed cardiopulmonary resuscitation and witnessed invasive procedures from the perspective of the adult patients and their relatives. | CINAHL MEDLINE OCLC PsycINFO ISI Web of Knowledge ERIC Evidence Based Medicine Reviews EMBASE The following registries were searched: JBI, Cochrane Collection, Sara Cole Hirsch Institute Virginia, Henderson International | A quantitative systematic review. | 15 studies in total: 1 case control design 2 randomised clinical trials 12 survey designs. | Patients who survived resuscitation, admitted as emergency cases. Family members. | Intensive-care units and cardiology, emergency departments, traumatology's emergency departments, respiratory and medical wards. | 5 England (south-west) 8 United States 2 Australia 1 Singapore 1 Turkey |

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| | | Nursing Library of Sigma Theta Tau, MEDNAR, RAND, SCIRUS, and health-evidence.ca. English-language published and unpublished studies from 1985 to 2010. | | | | | |
| **Authors** | **Aim** | **Methodology** | **Review typology** | **Number of studies included** | **Participants and sampling** | **Service** | **Countries** |
| Paplanus et al. (2012) PART II | To examine the evidence concerning witnesses' cardiopulmonary resuscitation and invasive procedures on adults from the perspective of healthcare providers. | CINAHL, MEDLINE, OCLC, PsycINFO, ISI Web of Knowledge, ERIC, Evidence Based Medicine, EMBASE, JBI, Cochrane, Sara Cole Hirsch Institute, Virginia Henderson International Nursing Library of Sigma Theta Tau, New York Academy of Medicine, | A systematic review. Meta-analysis of 5 studies, with the remaining ones in narrative form. | 28 studies in total:<br>1 randomised controlled trial (JBI Level II evidence)<br>1 match-controlled study (JBI level IIIa evidence)<br>26 cross-sectional survey designs (JBI Level IIIc evidence) | 7531 health professionals (predominately nurses and physicians) | Adult patients in intensive-care units, emergency departments, trauma rooms and general nursing wards. | 11 United States<br>2 United Kingdom<br>1 Ireland<br>4 Turkey<br>3 Australia<br>2 Singapore<br>2 Germany<br>1 Belgium<br>1 Canada<br>1 Europe |

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| | | MEDNAR, RAND, SCIRUS and health-evidence.ca. English language studies from 1985 to 2010. | | | | | |
| **Authors** | **Aim** | **Methodology** | **Review typology** | **Number of studies included** | **Participants and sampling** | **Service** | **Countries** |
| Porter et al. (2013) | To undertake a review of the quantitative research literature to see whether emergency staff and the public supported the implementation and practice of witnessed cardiopulmonary resuscitation in the emergency department. | CINAHL, Ovid Medline, PSYCHINFO, Pro-Quest, Theses Database, Cochrane and the Google Scholar search engine. From 1992 to October 2011. | A quantitative systematic review. | 14 studies in total:<br>1 randomised controlled trial<br>2 pre-test/post-test<br>8 survey design studies<br>3 descriptive designs. | 2741 emergency professionals and 305 general public (patients and family) | Emergency departments (adults and paediatric patients). | 7 United States<br>1 Singapore<br>3 Australia<br>1 Turkey<br>1 United Kingdom<br>1 Ireland |
| Sak-Dankosky et al. (2013) | To identify, review and discuss the extant empirical research on the attitudes and experiences of nurses and | CINAHL, PsycINFO and PubMed. Papers in English, published between 2007 and 2012. | Integrative review. | 15 studies in total:<br>8 quantitative approach<br>2 qualitative design<br>5 mixed methods.<br>Methods:<br>Self-report | 2571 healthcare professionals (nurses, physicians). | Adult inpatients. Intensive-care units, emergency departments, cardiac care units and other | 3 United States<br>2 Israel<br>2 Turkey<br>1 Canada<br>1 Germany<br>1 Ireland |

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| | physicians regarding witnessed cardiopulmonary resuscitation on adult patients. | | | questionnaires: 3 studies used questionnaires developed by Fulbrook et al. (2005) 5 questionnaires. Content validity. | | hospital units. | 1 South Africa 1 Iran 1 in Malaysia 1 China 1 four European countries: the United Kingdom, Norway, Ireland, Sweden |
| **Authors** | **Aim** | **Methodology** | **Review typology** | **Number of studies included** | **Participants and sampling** | **Service** | **Countries** |
| Porter et al. (2014) | To develop an understanding of the perceived benefits, barriers and enablers to implementing and practising witnessed cardiopulmonary resuscitation. | CINHAL, Ovid Medline, PSYCHINFO, Pro-Quest, Theses Database, Cochrane and Google Scholar. Papers in English published between 1992 and June 2012. | A systematic review of the literature. Content analysis. | 16 studies in total: 12 quantitative studies (2 pre-test/post-test, 1 randomised controlled trial and 9 survey designs) 4 qualitative studies. | Physicians and nurses Paediatric critical care and emergency providers Family members Patients. | Emergency departments (adults and paediatric patients). | 1 Austria 8 United States 2 United Kingdom 1 Australia 1 Singapore 1 Sweden 1 Turkey 1 Ireland |
| McAlvin et al. (2014) | To evaluate the family members' experiences when | CINAHL, MEDLINE, Ovid, and PubMed | A systematic literature search. | 6 studies in total: 1 cross-sectional scale survey | 77 parents and families of critically ill | Emergency departments and paediatric | 5 United States 1 |

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| | they were present during cardiopulmonary resuscitation and invasive procedures in paediatric critical care settings, in particular their satisfaction with the care provided and their ability to cope. | Papers published in English were reviewed between 1995 and 2012. | A thematic analysis was developed. | 1 qualitative (hermeneutic phenomenological approach)<br>4 mixed-method designs. | children. | intensive-care units in children's hospitals. | Australia |
| **Authors** | **Aim** | **Methodology** | **Review typology** | **Number of studies included** | **Participants and sampling** | **Service** | **Countries** |
| Ferreira et al. (2014) | To identify evidence in the literature related to actions to promote the presence of family members during cardiopulmonary resuscitation and invasive procedures | PubMed, SciELO and Lilacs databases from 2002 to 2012. Papers published in Portuguese, English or Spanish. | Integrative review. Qualitative content analysis according to Morse and Field. | 15 studies in total:<br>11 descriptive survey<br>1 experimental<br>2 observational<br>1 qualitative (phenomenology). | 10 studies included healthcare professionals.<br>5 studies included families. | Paediatric and neonatal critical care units. | 12 United States<br>1 Australia<br>1 United Kingdom<br>1 Turkey |
| Oczkowski et al. (2015) | To evaluate the effect of offering witnessed cardiopulmonary resuscitation | MEDLINE, Embase, Cochrane, Register of Controlled Trials, | A systematic review and meta-analysis. | 3 randomised clinical trials of adults.<br>1 randomised clinical trials of | 319 events when families were present.<br>570 relatives of patients who | Adult and paediatric inpatients and intensive-care units. | 1 France<br>1 Australia<br>1 United Kingdom |

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| | compared to typical patient care on: mortality, resuscitation quality and the psychological health of family members. | CINAHL, clinicaltrials.gov, Google Scholar from inception up to August 2015. | | children. Intervention: offering family the opportunity to be present during cardiopulmonary resuscitation versus usual care. | underwent cardiopulmonary resuscitation. | | 1 United States |
| Cypress et al. (2017) | To describe, analyse and synthesise the findings of qualitative studies during the 10-year period. These examined the experiences of witnessed cardiopulmonary resuscitation on the patients, their family members and nurses. | CINAHL, MEDLINE, Web of Science and PsycINFO searched for qualitative papers published in English from 2004-2013. | Qualitative meta-synthesis (Sandelowski Method, 2007) that provided an interpretive integration of qualitative findings. | 17 studies in total:<br>8 qualitative descriptive designs<br>3 grounded theory studies<br>4 phenomenological studies;<br>1 ethnographic study<br>1 action research study. | The findings of this meta-synthesis represented 77 critically ill patients, 194 family members, and 73 nurses. | Adult intensive-care units and emergency departments. | 8 United States<br>2 Canada<br>1 New Zealand<br>2 United Kingdom<br>1 Norway<br>2 Sweden<br>1 Hong Kong |
| Powers et al. (2017) | To evaluate the effect of education on how nurses and other healthcare providers supported witnessed | CINAHL, MEDLINE and PubMed papers published in English from 1987-2016. | Systematic review of educational intervention studies about witnessed cardiopulmonary resuscitation. | 16 quasi-experimental designs. | Nurses, nursing students and physicians in intensive-care units and emergency departments, Approximately | Adult and paediatric intensive care-units and emergency departments. | 13 United States<br>1 France<br>2 Australia |

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| | cardiopulmonary resuscitation. To evaluate the types of educational interventions (classroom, simulation and online approaches) used to improve witnessed cardiopulmonary resuscitation support. | | | | 2500 professional experiences. | | |
| Toronto et al. (2018) | To consider witnessed cardiopulmonary resuscitation from the perspective of family members. | CINAHL, PsychINFO, Academic Search, SocINDEX, PubMed, ProQuest databases and Google Scholar. Papers from 1994 to 2017. | An integrative review. | 12 studies in total:<br>5 qualitative methods<br>2 quantitative methods<br>5 mixed methods. | Family. | Paediatric and adult patients. | 8 United States<br>1 Hong Kong<br>1 Australia<br>1 Belgium<br>1 Sweden |